

Exploring LifeLines to Visualize Patient Records

Catherine Plaisant, Ph.D., Anne Rose

Human-Computer Interaction Laboratory, University of Maryland at College Park

Computerized medical records pose tremendous problems to system developers. But all the efforts to solve those problems will only succeed if appropriate attention is also given to the user interface design [1]. Long lists to scroll, clumsy searches, endless menus and lengthy dialogs will lead to user rejection. We designed a general visualization technique for personal histories called LifeLines and are currently exploring its use for medical patient records.

LifeLines present a one screen overview of the record using timelines and provide direct access to the data. Problems, hospitalizations and medications can be represented as horizontal lines, while icons or simple ticks represent discrete events such as physician consultations, progress notes or tests. Line color and thickness can illustrate relationships or significance. Techniques are also available to display large records [2]. Rescaling tools and filters allow users to focus on part of the information, revealing more details. Our work on the visualization of personal histories started during a project with the Maryland Department of Juvenile Justice. For that application we

developed a working prototype in Delphi on a PC to present youth records (including, cases, placements, worker assignments and reviews) [2]. In this initial exploration of the use of LifeLines for medical patient records we worked with a cardiologist who reviewed some of his patient record with us and proposed adaptations to the interface. We prepared a series of screen mockups of the modified design (e.g. Figure 1) and we will prototype and test the design in the fall.

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1. Powsner, S.M., Tufte, E.R., Graphical summary of patient status. *The Lancet*, 344 (Aug 6, 1994) 386-389
2. Plaisant, C., Milash, B., Rose, A., Widoff, S., Shneiderman, B., LifeLines: Visualizing Personal Histories. *Proc. of CHI 96*, ACM, New York. 221-227

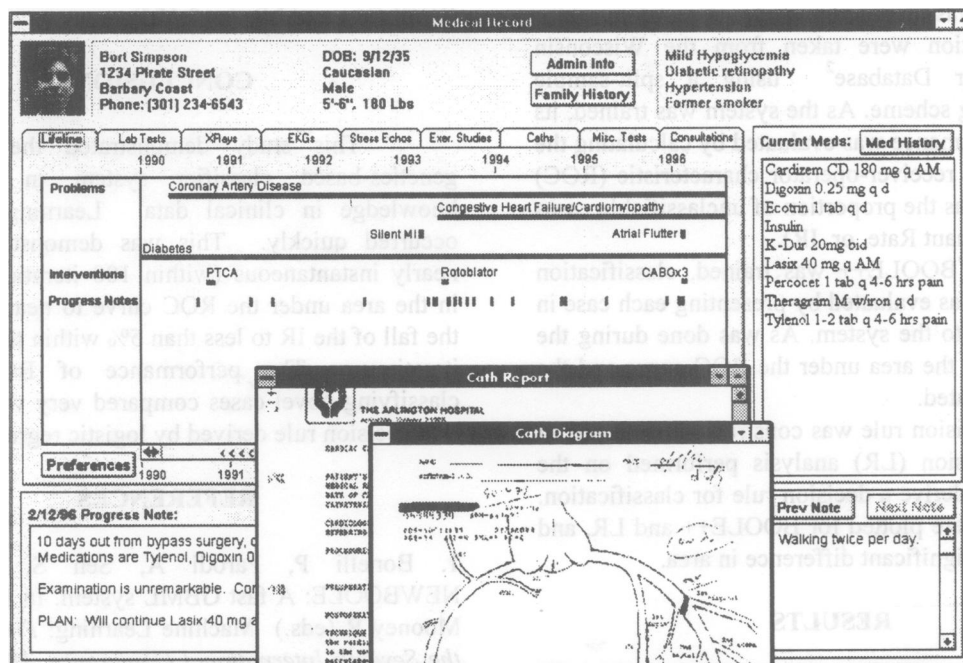


Figure 1: In this scenario the user (a cardiologist) chose to display only a subset of the information in the overview screen (problems and interventions) giving more space for the progress notes and current medications. A click on PTCA in the interventions line brings the report and a hand-drawn diagram associated with the intervention. Tests are available as tabs on top of the timelines. One click can bring the last EKG or the last lab test (with access to previous ones). Lines showing the medication history are added to the LifeLines display when the "med. history" button next to the current medication is clicked. The physician can zoom in a period of interest and see more details, eventually revealing test data (e.g. cholesterol levels and medication dosage for effectiveness review.)